

STYRIKOVICH, M.A.

Pool Abstracts
Vol. XV, No. 2
Feb. 1964
Electricity and
Electric Power.

1977. MEANS OF IMPROVING ECONOMY OF THERMAL POWER STATIONS (PROBLEM OF STEAM AT HIGH PARAMETERS). Styrikovich, M.A. (Vestn. Akad. Nauk SSSR (J. Acad. Sci. U.S.S.R.), Aug. 1953, 22-33). Power and district heating in U.S.S.R. are discussed, the problems arising in metallurgy, theory of plasticity, hydrodynamics, heat exchange, chemistry and physical chemistry, and the organization for coordinating research upon them, are reviewed.

СТЫРКОВИЧ, М.А.

USSR .

2449 AIEE-Lib/Trans-499

ON THE INTERRELATION BETWEEN THE HYDRODYNAMICS OF STEAM-WATER MIXTURES, THE TEMPERATURE DISTRIBUTION IN A METAL AND THE DEPOSITION OF EASILY SOLUBLE SALTS IN HORIZONTAL STEAM-GENERATING PIPES. M. A. Styrtkovich, Z. L. Miropolskii, and N. M. Anakin. Translated by J. B. Sykes from *Izvist. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk.* 432-40(1953). 10p.

Several series of experiments have been performed in a closed circulating system including heated vertical and horizontal portions of steam-generating pipes of various diameters. It was found that deposition of NaCl and Na_2SO_4 took place in the horizontal parts of boiler pipes when the temperatures of the upper part of the pipe wall were higher than those of the lower part. The probability of the occurrence of deposition increases with pressure. (M.P.G.)

STYRIKOVICH, MA.

USSR/Engineering - Power, Steam Turbines Mar 53

"The Turbine of Peace," M. A. Styrikovich, Corr
Memb Acad Sci USSR

Nauka i Zhizn', No 3, pp 8-10

Briefly describes 150,000 kw single-shaft three-stage turbine which is, according to author's claim, unique in design. It will drive single generator of electric power station at 3,000 rpm, using steam under pressure of 170 atm and with temp of 550°C. Two boilers will produce steam of these parameters at rate of 240 t per hr, consuming about 2,000 t of

271T63

coal per day. Despite using fuel with 27-30% of ash and up to 35% of moisture, it is claimed that efficiency of boilers will amount to 90%. Steam supposed to be of exceptional purity with total amount of admixtures not more than 0.05 g per t.

STYRIKOVICH, M.A.

Journal of Applied Chemistry
June 1954
Chemical Engineering and
Electrochemical.

Application of radioactive isotopes in the investigation of the carry over of salts with steam. M. A. Styrikovich and Ya. C. Binokur (*Dokl. Akad. Nauk. SSSR*, 1953, 80, 179-182).—Use of radioactive isotopes of P, S, Ca. and Na added to boiler waters permits the determination of the amount of salts carried over with steam in concn. as small as 1×10^{-4} mg. per kg. of steam. Carry over of Na_2SO_4 at low evaporation rates is proportional within wide concn. limits to the concn. of Na_2SO_4 in the boiler water. Experiments with radioactive ^{32}P have shown that the carry-over increases rapidly with the pressure in the boiler and with the vol. of steam raised per unit of free surface per hour. The intensity of radiation used in the experiment was ~ 100 mc. per ton of water.

S. K. LACHOWICZ.

10-28-54
RMZ

STYRIKOVICH, MIKHAIL ADOL'FOVICH

STYRIKOVICH, Mikhail Adol'fovich; SHUKHER, S.M., redaktor; SKVORTSOV, I.M.,
tekhnicheskii redaktor

[Processes occurring inside steam boilers] Vnutrikotlovye protsessy.
Moskva, Gos. energ. izd-vo, 1954. 339 p. (MIRA 8:4)
(Steam boilers)

✓ 7745 AERE-115/Trans-361
62 NEW RESULTS ON THE TEMPERATURE DISTRIBUTION
IN A BOILER WATER PIPE AT VERY HIGH PRESSURES.
M. A. Styrikovich and M. E. Ghitman. Translated by J. B.
Bykov from Doklady Akad. Nauk S.S.S.R. 96, 69-72(1964).
5p.

As a result of the investigation made on the limits of safe operating temperature conditions in a vertical boiler water pipe of diameter 50 mm at very high pressures (82 to 209 kg/cm²) it has been found that: The region of unstable surface temperature, in the range of specific thermal fluxes and circulation parameters investigated, is found for weight steam contents considerably less than unity. For applied weight steam contents of over 100 kg/m²sec, there is a considerable range of intermediate temperature distributions, characteristic of an increased steam content and a gradual decrease of the heat exchange from the values found in bubble boiling to those corresponding to dry saturated steam. The treatment of the "destruction of normal circulation" merely as a phenomenon of standstill or reversal of the circulation is not in accordance with the properties of processes in boilers at very high pressures. For specific thermal fluxes of (400 to 450) × 10³ kcal/m²h, a decrease in the circulation rate to 0.4 or 0.5 m/sec, the weight steam velocity being about 100 or 150 kg/m²sec, i.e. a decrease of the multiplicity of the circulation to 2 or 2.5, brings about a serious destruction of the normal circulation, which may lead to undesirable consequences. (unk)

STYRIKOVICH, Mikhail Adol'fovich

STYRIKOVICH, Mikhail Adol'fovich; MOROZ, I.I., redaktor; ISLENT'YEVA,
P.G., tekhnicheskii redaktor

[Progress and prospects in the development of Soviet boiler construction] Uspekhi i perspektivy razvitiia sovetskogo kotlostroeniia. Moskva, "Pravda," 1955. 23 p. (Vsesoiuznoe obshchestvo po rasprostraneniui politicheskikh i nauchnykh znani, Ser. 4, no. 13). (MLRA 8:6)

1. Chlen-korrespondent Akademii nauk SSSR (for Styrikovich).
(Boilers)

STYKALOV, M.A. and MIRPOL'SKIY, E.L.
STERNIKOVICH, M.A. and MIRPOL'SKIY, E.L.

"O temperaturnom rezhime raboty gorizonta'nykh i naklonnykh parogeneri-
ruyushchikh trub pri vysokikh davleniyakh," Hydrodynamics and Heat Transfer
in Boiling in High Pressure Boilers. U.S.S.R. Academy of Sciences
(Moscow: 1955, 25 pp.).

A collection of twelve papers describing experimental work on the movement of
steam and water, the formation of steam and heat transfer in boiler tubes.

SOV/124-57-5-5414

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 5, p 45 (USSR)

AUTHORS: Styrikovich, M. A., Kholodovskiy, G. Ye.

TITLE: Investigation of the Effective Circulation-velocity Heads in Steam-boiler Pipes at Elevated Water-vapor Pressures (Issledovaniye poleznykh naporov tsirkulyatsii v parogeneriruyushchikh trubakh pri vysokikh davleniyakh vodyanogo para)

PERIODICAL: V sb.: Gidrodinamika i teploobmen pri kipenii v kotlakh vyso-
kogo davleniya. Moscow, AN SSSR, 1955, pp 99-136

ABSTRACT: The authors investigated the effective circulation-velocity heads in an unheated 56-mm-diameter vertical pipe at circulation speeds of from 0.2 to 0.9 m/sec, within a range of steam pressures from 35 kg/cm² up to the critical pressure. The heat-flow rates and reduced steam-flow rates achieved in the experiments greatly exceeded those encountered in the pipes of even the most powerful present-day natural-circulation boilers. It was found that, as the steam pressure, the circulation speed, and the reduced steam-flow rate increased, head losses due to slippage decreased. Regardless of the circulation speed, at steam pressures of 182 kg/cm² and above

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SOV/124-57-5-5414

Investigation of the Effective Circulation-velocity Heads in Steam-boiler (cont.)

the head losses due to slippage are practically nil, and the actual effective pressure head equals the theoretical value thereof calculated with allowance made for the head losses due to friction. At steam pressure 142 kg/cm² with a circulation speed of 0.5 m/sec and above, and at steam pressure 113 kg/cm² with a circulation speed of 0.7 m/sec, no head losses at all due to slippage were observed. The fact that the head losses due to slippage were found to decrease concurrently with increasing steam pressure is attributed by the authors to a simultaneously occurring decrease in the surface tension of the water and to the resulting greater dispersedness of the vapor phase. Bibliography: 4 references.

Yu. A. Lashkov

Card 2/2

SOV/124-57-3-3203

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 3, p 80 (USSR)

AUTHORS: Styrikovich, M. A., Shitsman, M. Ye.

TITLE: An Investigation of the Temperature Conditions in the Operation of a Vertical Boiling Tube Under Superhigh Pressures (Issledovaniye temperaturnogo rezhima raboty vertikal'noy kipyatil'noy truby pri sverkhvysokikh davleniyakh)

PERIODICAL: V sb.: Gidrodinamika i teploobmen pri kipenii v kotlakh vysokogo davleniya. Moscow, AN SSSR, 1955, pp 206-228

ABSTRACT: The paper adduces the results of an experimental investigation of the temperature regime of a vertical boiling tube 30 mm in diameter. The experiments were conducted on a stand with pressures of 182-209 atm abs, a specific heat flux of 230-720,000 kcal/m²/hr, circulation velocities from 0.2 to 2.2 m/sec, and gravimetric steam content from 8 to 100%. It is established that a considerable range of intermediate regimes exists within the zone of pressures and circulation parameters investigated, during which regimes, in proportion as the steam content increases, the intensity of the heat transfer gradually decreases from the values corresponding to a

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SOV/124-57-3-3203

An Investigation of the Temperature Conditions (cont.)

normal nucleate boiling to the values which correspond to the heat transfer to dry saturated steam. The authors point out that with specific heat fluxes of the order of 400-450,000 kcal/m²/hr a decrease in the circulation velocity to 0.4-0.5 m/sec and of the circulation multiplicity to 2.0 - 2.5 may lead to damage to the steam pipes of boilers operating at superhigh pressures.

Z. L. Miropol'skiy

Card 2/2

SOV/124-58-1-879

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 118 (USSR)

AUTHOR: Styrikovich, M. A.

TITLE: Investigation by Means of Radioactive Isotopes of the Carry-off of Salts in Steam and of the Hydrodynamics of a Two-phase Liquid
(Issledovaniye unosa soley s parom i gidrodinamiki dvukhfaznoy zhidkosti metodom radioaktivnykh izotopov)

PERIODICAL: Sessiya AN SSSR po mirnomu ispol'zovaniyu atom. energii, 1955, Zasedaniya Otd. tekhn. n. Moscow, Izd-vo AN SSSR, 1955, pp 210-227

ABSTRACT: A brief review of the results of experimental investigations and some comments on methods of radioactive-isotope investigations in the measurement of component concentrations. The investigation of the carry-off of salts aimed at the establishment of relationships for the determination of the impurity content in water vapor at pressures, temperatures, specific flow rates, and salt concentrations in water that are typical for modern steam-turbine powerplants. The total impurity concentration in the steam amounts to less than 0.2 mg/kg of steam. By utilizing radioactive salts the author succeeded in

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SOV/124-58-1-879

Investigation by Means of Radioactive Isotopes (cont.)

separating individual components in concentrations as low as 10^{-5} mg/kg. The measurement of the amount of an impurity contained in the steam was accomplished by means of the measurement of the activity of the condensate. The salts and other substances dissolved in the water are carried off by the steam partly within suspended water droplets and partly as direct solutions of the salts within the water vapor. The carry-off with the liquid droplets is characterized by a carry-off coefficient which depends on the speed of motion of the steam, the pressure, and the height of the liquid column. The carry-off of salts in solution within the water vapor is characterized by a so-called distribution coefficient. It is established that the distribution coefficient is proportional to some power of the ratio of the densities of the water vapor and the liquid. The exponent of this ratio is constant for each soluble substance. An investigation of the "bulging" of the water volume due to the formation of bubbles within the liquid was carried out by means of a thin transmitted beam of gamma rays. The influence of the salt content on the change in volume of the liquid and the carry-off coefficient was studied. Gamma-ray inspection was also used for the investigation of the structure of the steam-water mixtures and the distribution of the steam and liquid over the section of horizontal and slightly sloping tubes while in motion.

D. A. Efros

Card 2/2

SOV/124-58-3-3020

Translation from: Referativnyy zhurnal, Mekhanika, 1958 Nr 3, p 68 (USSR)

AUTHORS: Styrikovich, M. A. Miropol'skiy, Z. L.

TITLE: On the Operational Temperature Conditions of Horizontal and Inclined High-pressure Steam-generating Tubes (O'temperaturnom rezhime raboty gorizonta'l'nykh i naklonnykh parogeneriruyushchikh trub pri vysokikh davleniyakh)

PERIODICAL: V sb.: Gidrodinamika i teploobmen pri kipenii v kotlakh vysokogo davleniya, Moscow. AN SSSR, 1955, pp 229-254

ABSTRACT: The article presents the results of experimental research on the operational temperature conditions of horizontal and inclined tubes with an internal diameter from 32 to 56 mm. The angle of inclination is from 0° to 10° , the pressure range is from 36 to 182 atm abs, and the heat transfer rate is from 40×10^3 to 230×10^3 kcal/m² hour. Description of the installation is given. Experimental methods are described in detail. Numerous graphs are presented. It has been established that there exists a considerable range of operational conditions during which increases are observed in the metal temperature of the upper parts of the tube wall. These increases are due

Card 1/2

STYRIKOVICH, M. A.

AID P - 1246

Subject : USSR/Engineering
Card 1/1 Pub. 110-a - 7/17
Author : Styrikovich, M. A., Corr. Mem., Academy of Sciences, USSR
Title : Ways of removing salts from a steam power installation
working at supercritical pressure
Periodical : Teploenergetika, 1, 31-34, Ja 1955
Abstract : An analysis is made of the behavior in the feed-water
loop of particles carried by the additional feed-water
flow. Different methods are considered for removing
such impurities from the steam-water cycle.
Institution : Moscow Power Institute
Submitted : No date

AID P - 1328

Subject : USSR/Engineering
 Card 1/1 : Pub. 110-a - 10/19
 Authors : Styrikovich, M. A., Corr. Memb., Academy of Sciences, USSR., Stermann, L. S., Kand. of Tech. Sci. and Syrnov, A. V., Eng.
 Title : Study of the carrying away of salts by steam by means of radioactive isotopes
 Periodical : Teploenergetika, 2, 43-46, F 1955
 Abstract : This article presents the results of study by means of radioactive isotopes of the relation between the intensity of carrying away of salts by steam and the volume of the steam load. The results obtained previously by the salt method compared with those established previously by the salt method. The equipment used is shown and the results are plotted on charts. Two Russian references (1950 and 1953).
 Institution : Moscow Section of the Central Scientific Research Institute for Boilers and Turbines
 Submitted : No date

86-00513R00165371

AID P - 1334

Subject : USSR/Engineering
 Card 1/1 : Pub. 110-a - 16/19
 Author : Styrikovich, M. A., Corr. Memb., Academy of Sciences, USSR
 Title : Outline of the History of Power Engineering in the USSR. (Review)
 Periodical : Teploenergetika, 2, 59-61, F 1955
 Abstract : Under the above title a series of monographs is being issued. The present review concerns 6 issues on heat power production dealing with the development of theoretical subjects and also with the history of power station construction and energy distribution. The whole series is prepared as a collective effort of 50 professors and instructors of the Moscow Power Engineering Institute im. Molotov.
 Institution : None
 Submitted : No date

STYRIKOVICH, M. A.

AID P - 2326

Subject : USSR/Engineering

Card 1/1 Pub. 110-a - 7/17

Authors : Styrikovich, M. A., Corr. Memb., Acad. of Sci., and
Katkovskaya, K. Ya., Kand. of Tech. Sci.

Title : Control of silicic acid content in saturated and super-
heated high-pressure steam

Periodical : Teploenergetika, 5, 34-37, My 1955

Abstract : Tests made with high-pressure boilers showed that a de-
crease in silicic acid content of steam resulting from
superheating is not due to the process of dehydration
but to partial settling of sodium silicate in the super-
heater, and also to a partial condensation of steam at
the superheater's inlet. Six diagrams and 1 table. Two
Russian, 1953 and 1 American reference.

Institution : None

Submitted : No date

USSR/Physics - Hydrodynamics

FD-3027

Card 1/1 Pub. 41 - 11/15

Author : Miropol'skiy, Z. L. and Styrikovich, M. A., Moscow

Title : Use of γ Rays in studying the hydrodynamics of diphase systems

Periodical : Izv. AN SSSR, Otd. Tekh. Nauk 9, 154-159, Sep 55

Abstract : Describes method of determining density of a water-steam system in a boiler by measuring the lessening of the intensity of a beam of γ rays when passed through such a medium. Describes experimental set-up. Presents theoretical calculation of the processes involved in diphase media. Drawings, formulae, graphs.

Institution:

Submitted : April 14, 1955

Subject : USSR/Power Eng. AID P - 3889
 Card 1/1 Pub. 110-a - 10/17
 Authors : Styrikovich, M. A. Corr. Memb., Aca. Sci., USSR,
 O. I. Martynova, and M. I. Reznikov, Kand. Techn. Sci.
 Moscow Power Institute
 Title : Some data on the solubility of sodium phosphate in
 feed water at near critical temperatures
 Periodical : Teploenergetika, 11, 41-44, N 1955
 Abstract : The article describes experiments with sodium
 phosphates in feed water in drum boilers with superhigh
 characteristics and evaporation by stages to establish
 the limit concentration and the influence of hydro-
 dynamic factors. Seven figures. One, 1953 Russian
 source, 2 English, 1937-1950.
 Institution : None
 Submitted : No date

AID P - 4081

Styrikovich, M. A.
 Subject : USSR/Power Eng.
 Card 1/1 Pub. 110-a - 6/14
 Authors : Styrikovich, M. A., Corr. Memb., Academy of Sciences,
 USSR, M. E. Shitsman, and Z. L. Miropol'skiy, Kand.
 Tech. Sci. Power Institute, Academy of Sciences.
 Title : Some data on temperature changes in a vertical boiling
 conduit at near-critical pressures.
 Periodical : Teploenergetika, 12, 32-36, D 1955
 Abstract : Tests with vertical boiling pipes at different pressures
 and various flue temperatures are explained. Some
 temperature changes in the pipe walls were noticed, which
 seemingly have considerable importance for establishing
 conditions of normal performance of vaporating-surfaces
 of super-high pressure boilers. Seven diagrams. Three
 Russian references, 1951-1952.
 Institution : None
 Submitted : No date

STYRIKOVICH, M.A., professor.

Solubility of impurities in water and water vapor and their behavior
in the steam passage of the electric power plant. Trudy MHI no.25:
106-122 '55. (MIRA 9:7)

1.Chlen-korrespondent AN SSSR.
(Feed water) (Steam)

STYRIKOVICH, M.A., professor; REZNIKOV, M.I., kandidat tekhnicheskikh nauk.

New liquid level indicator. Trudy MBI no.25:222-230 '55. (MIRA 9:7)

1.Chlen-korrespondent AN SSSR (for Styrikovich).
(Indicators for steam engines)

STYRIKOVICH, M. A.

USSR/ Chemistry - Physical chemistry

Card 1/2 Pub. 22 - 24/47

Authors : Styrikovich, M. A., Memb. Corresp. of Acad. of Sc. USSR.; Khaybullin, I. Kh.; and Iskhvirashvili, D. G.

Title : Solubility of salts in high pressure water vapor

Periodical : Dok. AN SSSR 100/6, 1123-1126, Feb 21, 1955

Abstract : The solubility of Na_2SO_4 , CaCl_2 , NaCl was investigated in saturated water vapors at pressures ranging from 100 to 200 atm. It was found that the solubility of solid substances in superheated water vapor at constant pressures in the zone of slight overheating has a negative coefficient, it reaches a minimum at a certain point and then acquires a positive coefficient in the zone of relative high overheating.

Institution : Acad. of Sc. USSR, The G. M. Krzhizhanovskiy Power Engineering Institute

Submitted : October 28, 1954

Periodical . Dok. AN SSSR 100/6, 1123-1126, Feb 21, 1955

Card 2/2 Pub. 22 - 24/47

Abstract : The solubility of the substances investigated in a superheated state was found to be qualitatively analogous to the change in the basic characteristics of the superheated vapor. Eight references: 5 USSR, 1 USA, 1 Scandinavian and 1 German (1940-1953). Graphs.

LEVIT, Grigoriy Osipovich, inzhener; BEL'KIND, L.D., doktor tekhnicheskikh nauk, redaktor; GLAZUNOV, A.A., doktor tekhnicheskikh nauk, redaktor; GOLUBTSOVA, V.A., kandidat tekhnicheskikh nauk, redaktor; ZOLOTAREV, T.L., doktor tekhnicheskikh nauk, redaktor; IZBASH, S.V., doktor tekhnicheskikh nauk, redaktor; KIRILLIN, V.A., redaktor; KONFEDERATOV, I.Ya., doktor tekhnicheskikh nauk, redaktor; PETROV, G.N., doktor tekhnicheskikh nauk, redaktor; SIROTINSKIY, L.I., doktor tekhnicheskikh nauk, redaktor; SOLOV'YEV, I.I., professor, redaktor; STYRIKOVICH, M.A., redaktor; SHNEYBERG, Ya.A., kandidat tekhnicheskikh nauk, redaktor; SHCHEGLYAYEV, A.V., redaktor; AMTIK, I.V., redaktor; FREDKIN, A.M., tekhnicheskii redaktor

[Outline history of power engineering in the U.S.S.R.] Ocherki po istorii energeticheskoi tekhniki SSSR. Red. komissiya L.D. Bel'kind i dr. Moskva, Gos. energ. izd-vo. No. 3. [Power congresses and conferences] Energeticheskii s"ezdy i konferentsii. 1956. 98 p. (MLRA 10:4)

1. Moscow. Moskovskiy energeticheskii institut. 2. Chlen-korrespondent AN SSSR. (for Kirillin, Styrikovich, Shcheglyayev)
(Power engineering--Congresses)

Styrlikovich, M. A.
AID P - 4421

Subject : USSR/Heat Engineering

Card 1/1 Pub. 110-a - 1/13

Authors : Knorre, G. F., Dr. Tech. Sci. and M. A. Styrlikovich,
Member-correspondent of the USSR Academy of Sciences

Title : Immediate perspectives in boiler-furnace engineering
development.

Periodical : Teploenergetika, 6, 3-9, Je 1956

Abstract : The immediate problem is reportedly the building of super
power plants consisting of 150,000-200,000 kw turbine-
boiler units. Recommendations are made for new designs
of regenerating equipment and furnaces.

Institution : None

Submitted : No date

STYRIKOVICH, M. A.

ON PRESSURE ONCE-THROUGH BOILERS.

It is stated that there is no difference in the reliability
of the critical point. Further experiments were
conducted on the critical point of water and water
showing this are discussed.

AID P - 5098

Subject : USSR/Engineering
Card 1/2 Pub. 110-a - 1/18
Authors : ~~Stavrikovich, M. A.~~ Corr. Mem. Academy of Sciences,
USSR, and I. K. Stasyulyavichus, Eng.
Title : Using special large peak-load boilers in a Heat and
Power Plant.
Periodical : Teploenergetika, 10, 3-8, 0 1956
Abstract : The expediency in using special large boilers for peak
district heating loads is demonstrated. The problems
of the distribution of load are examined. The peak-
load boilers must be inexpensive, simple in design and
reliable in operation. Because of the wide range of
steam and hot-water loads these boilers must function
at different load levels. The hot-water type is simpler
and less expensive, while the steam type is more
flexible in operation and can store the steam at the

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OTIRIMOVICH, M. A.

"Investigation of the solubility of low volatility substances in high pressure steam by radio isotopes," a paper submitted at the International Conference on Radioisotopes in Scientific Research, Paris, 9-20 Sep 57.

STYRIKOVICH, M.A., red.; OZERSKIY, V.A., red.; LARIONOV, G.Ye., tekhn.red.

[Steam boilers in West European countries. Translations] Parovye kotly zapadnoevropeiskikh stran. Perevody statei pod obshchei red. M.A.Styrikovicha. Moskva, Gos. energ. izd-vo, 1957. 55 p. (MIRA 11:3)

1. Chlen-korrespondent AN SSSR (for Styrikovich)
(Boilers)

STYRIKOVICH
NEVSTRUYEVA, Ye.I., [translator]; SHEVELEV, Ya.V., [translator];
STYRIKOVICH, M.A., redaktor; SHESTOPEROVA, N.V., redaktor;
KLIMENAU, S.V., tekhnicheskij redaktor.

[Four lectures on nuclear energy] Chetyre lektsii po iadernoi
energetike. [Translated from the English] Perevod s angliiskogo
E.I.Nevstruevoi i Ya.V.Sheveleva. Pod red. M.A.Styrikovicha.
Moskva, Izd-vo inost.lit-ry, 1957. 228 p. (MIRA 10:11)

1. Institution of Mechanical Engineers, London. 2. Chlen-korrespondent
Akademii nauk SSSR (for Styrikovich).
(Atomic energy)

10(4): 21(5): 24(8)	PHASE I BOOK EXPLORATION	30V/2457
<p>Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izucheniye v narodnom khozyaystve i nauke. 26. Moscow, 1957</p> <p>Tepletehnika i gidrodinamika: trudy konferentsii, tom 4 (Heat Engineering and Hydrodynamics: Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science, Vol. 4) Moscow, Gosenergoizdat, 1958. 88 p. Extra slip inserted. 2,500 copies printed.</p> <p>Sponsoring Agencies: Akademiya nauk SSSR, and USSR, Gidromoye upravleniye po ispol'zovaniyu atomnoy energii.</p> <p>Eds.: M. A. Syrtkovich (Resp. Ed.), G. Ye. Kholodovskiy, and M. S. Poshchev; Ed. of Publ. House: L. M. Sineletnikov; Tech. Ed.: M. I. Borunov.</p> <p>NOTE: This collection of articles is intended for scientists and laboratory workers concerned with the use of radioactive and stable isotopes.</p> <p>CONTENTS: This collection of papers deals with the application of radioactive and stable isotopes as measuring tools in various types of scientific investigation. No specialities are mentioned. References are given after some of the articles.</p> <p>1. Bartolomey, G.O., Ya.O. Vinokur, Y.A. Kolokol'tsev, and V.I. Penkov. Use of Gamma Rays for Studying the Process of Diffusion 9</p> <p>2. Kutsalevskiy, S.S., and V.K. Moskvicheva. Use of Gamma-rayscopy for Studying the Hydrodynamics of a Multifluid System 12</p> <p>3. Polasavskiy, P.O., and M.A. Shapkin. Method of "Tagged" Atoms for Investigating Water and Steam Content in Surface Boiling of a Fluid 16</p> <p>4. Kudryavtsev, V.S. Determining the Specific Surface Area of Quartz and Cement Powders by the Sorption Method with the Use of Tagged Atoms 20</p> <p>5. Nezhnitskiy, V.M., and I.I. Kuchalova. Use of Radioactive Isotope 35 for Studying Sulfate Corrosion of Concrete 28</p> <p>6. Tsvetkov, N.A., V.I. Pavlovskiy, and V.A. Lyulin. Methods for Determining the Density and Moisture Content of Soils with the Aid of Radioactive Emulsions 33</p> <p>7. Polozov, L.O., and N.A. Rumyantsev. Study of the Processes of Moisture Transfer in Building Materials by Means of Gamma-rayscopy 38</p> <p>8. Syrtkovich, M.A., I.Kh. Davbuldin, and L.K. Khokhlov. Use of Radioactive Isotopes for Investigating the Solubility of Salts in Water Vapor at High Pressures 41</p> <p>9. Stepanov, L.S., A.Ya. Antonov, and A.V. Surmov. Investigation of the Characteristics of Vapor at a Pressure of 185 atm. with the Aid of Radioactive Isotopes 46</p> <p>10. Nedyalkov, V.A. Use of Radioactive Isotopes for Observing the Motion of the Molten Glass Mass in Glass Furnace Tanks 52</p> <p>11. Bogdanov, V.V. Use of Radioactive Isotopes in Studying the Filtration of Fluids Through Porous Media 57</p> <p>12. Lopyrevskaya, D.I., and A.Ya. Pavlovskiy. Radioisotope Methods for Investigating Flow Processes of Fluids in a Porous Medium 62</p> <p>13. Bogdanov, M.A., L.S. Zurbilin, V.S. Frolin, and L.I. Korshak. Investigation of the Hydrodynamics of a Fluid in the Central Rotor of a Settling centrifuge with the Aid of Radioactive Isotopes 67</p> <p>14. Volynskiy, M.P., M.Y. Gurev, and B.Ya. Minkov. Investigation of the Motion of Water in Peat Under Laboratory and Field Conditions with the Use of Radioactive Isotopes 72</p> <p>15. Arhangel'skiy, N.M. Use of Radioactive Isotopes for Investigating Suspensions of River Silt 78</p> <p>16. Vernik, A.I., and A.S. Shubin. Use of Radioactive Isotopes for Investigating the Mechanism of the Drying Process 85</p>		

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[History of power engineering in the U.S.S.R.; in three volumes]
 Istoriia energeticheskoy tekhniki SSSR; v trekh tomakh. Moskva, Gos.energ.izd-vo.

(Continued on next card)

BADYL'KES, I.S.---(continued) Card 2.

Vol. 1. [Heat engineering] Teploekhnika. Avtorskii kollektiv toms
Badyl'kes i dr. Red. --sost. toms I.IA. Konfederatov. 1957. 479 p.

(MIRA 10:8)

1. Chlen-korrespondent Akademii nauk SSSR (for Shcheglyayev,
Kirillin, Styrikovich). 2. Moscow. Moskovskiy energeticheskiy
institut

(Heat engineering--History)

STYRIKOVICH, M.A.

CHERNYAYEV, I.I., akademik, red.; STYRIKOVICH, M.A., red.; CHMUTOV, K.V., red.;
SHKROB, M.S., doktor tekhn. nauk, red.; RAVICH, M.I., doktor khim.
nauk, red.; PIROPOL'SKIY, Z.L., red, izd-va; SHAPRKIN, I.F., red.
izd-va; KISILEVA, A.A., tekhn. red.

[Intra-boiler physical and chemical process, water preparation and
water operations of boilers in electric power plants of high and
ultrahigh parameters] Vnutrikotlovye fiziko-khimicheskie protsessy,
vodopodgotovka i vodnye rezhimy kotlov na elektrostantsiyakh
vysokikh i sverkhvysokikh parametrov. Moskva, 1957. 594 p.
(MIRA 11:2)

1. Akademiya nauk SSSR. Komissiya po paru vyyokikh parametrov.
2. Chlen-korrespondent AN SSSR (for Styrikovich, Chmutov)
(Boilers) (Electric power plants)

H-5

USSR /Chemical Technology. Chemical Products
and Their Application
Water treatment. Sewage water.

Abs Jour: Referat Zhur - Khimiya, No 1, 1958, 1724

at a velocity of 0.0062 m/second (time of contact 44 seconds). Another method of saturating the steam consisted in filling the reactor with stainless steel turnings and passing into it, from the generator, steam containing a large concentration of the salt the excess of which was deposited on the walls of the reactor and on the turnings while the portion dissolved in the steam passed through the reactor with the out-flowing steam. Both methods yielded results which were in good agreement. Determination of the concentration of the salt in the steam was effected by means of radioactive isotopes. Solubility of NaCl was determined at 180-300 atmo-

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Water treatment. Sewage water.

Abs Jour: Referat Zhur - Khimiya, No 1, 1958, 1724

bility minimum at all pressure levels is found at 500 (0.0045 mg/kg at 300 atmospheres gauge pressure). With increasing pressure the minimum solubility value increases. Solubility of CaCl_2 was studied at 240-300 atmospheres gauge pressure and 400-650. This salt behaves analogously to NaCl . Solubility minimum (3.8 mg/kg) at 300 atmospheres gauge pressure is found at 600. With increasing pressure the position of the minimum is shifted toward higher temperatures. Solubility of CaCO_3 was studied at 300 atmospheres gauge pressure and 400-650; solubility minimum (0.0182 mg/kg) is found at 465.

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and Their Application
Water treatment. Sewage water.

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Abs Jour: Referat Zhur - Khimiya, No 1, 1958, 1724

The authors consider that all the chlorides, at the usual concentrations in which they occur in the feed water of uniflow boilers, must pass through the boiler. Na_2SO_4 will form no deposits if its concentration in the feed water does not exceed 0.022 mg/kg, and CaCO_3 if its concentration does not exceed 0.0182 mg/kg; CaSO_4 will remain, practically completely, in the boiler. As one of the methods for the removal of salts from the boiler-turbine cycle is proposed the deposition of CaSO_4 within

Card 5/6

623

AUTHOR: Styrikovich, M.A. (Corresponding Member of the Ac.Sc. USSR).

TITLE: Certain questions of the development of thermal power engineering in the USSR. (Nekotorya voprosy razvitiya teploenergetiki SSR).

PERIODICAL: "Teploenergetika" (Thermal Power), Vol.4, No.5, May, 1957. pp.3-6 (USSR).

ABSTRACT:

Power engineering in the Soviet Union is entering into a new phase associated with the transfer from large power systems to inter system links. This is associated with the construction of super powerful stations with very large boiler-turbine units. In the near future the operating conditions of power systems will greatly change as reserves accumulate and limitations on the output of power are removed. Finally, the fuel basis of power is changing with increased consumption of cheap coals from the eastern regions of the country, fuel oil and natural gas. Under these conditions long term planning assumes particular importance especially as it takes a long time to design and build a large power station. Long term planning assumes particular importance in the conditions of partial decentralisation of industrial management, which is being undertaken to make the best use of local resources and which increases the responsibility of the

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APPROVED FOR RELEASE: 08/26/2000

CIA-RDP86-00513R001653710013-4"

Certain questions of the development of thermal power engineering in the USSR. (Cont.)

Central Planning Organisation for even development of the power resources of the country as a whole.

The development of the fundamentals of the future plan of power development is a great task that will take a long time. However, it is already advisable to consider a number of questions relating to the approach to this development. In working out long term prospects, economic considerations assume particular importance. Although the rate of development of power engineering has been the centre of attention in recent years not enough attention has been paid to the reduction of costs, particularly first costs. This has resulted from the concept of limited irreplaceable power resources which led to attempts to economise fuel at all costs. However, there is no doubt that reserves of coal and uranium as a whole will ensure the most rapid development of power for 200 to 300 years, which should be sufficient to make available new kinds of nuclear energy.

However, the question of producing cheap power in the near future will be solved differently in different countries. In almost all countries deep mined coal has become more expensive and oil and gas are playing a larger part. On the other hand, the production of open

any method that gives fuel economy of the order of 1% for an additional expenditure of not more than 10 roubles per kilowatt. With fuel at 10 roubles per ton it is not possible to employ any means

623

Certain questions of the development of thermal power engineering in the USSR. (Cont.)

initial cost by more than 2.5 roubles per kilowatt. These estimates are based on a pay-off time of eight years. Thus, the use of cheap coals will modify the design of power stations. When the fuel cost is 40 to 50 roubles per ton, it is already advisable to use only pearlitic steels and not the expensive austenitic steels and when the fuel is very cheap it should be verified whether it is advisable to use a pressure of 130 atms and reheat. Other design features are also affected such as the best degree of vacuum and the steam load on the exhaust section of the turbine. Thus, in a station burning expensive fuel it is advisable to verify whether the use of a single shaft high speed machine is justifiable for turbine outputs above 200 MW, but with cheap fuel single shaft output may exceed 400 MW. With expensive fuel the flue gas temperature should not exceed 110 - 120°C but with cheap fuel the best temperature may be over 200°C.

The immense scale of consumption of individual kinds of power fuel may make it necessary to design special boiler sets for them. It will be particularly important to develop special equipment for stations burning natural gas, particularly if it is not necessary to provide for future coal burning. Stations burning

STYRIKOVICH, M.A.; BARTOLOMEY, G.G., kandidat tekhnicheskikh nauk;
KOLONOL'TSEV, V.A., kandidat tekhnicheskikh nauk.

The effect of volumetric steam content on the coefficient of the
effluent [with summary in English]. Teploenergetika 4 no.10:9-12
O '57. (MLRA 10:9)

1. Chlen-korrespondent Akademii nauk SSSR (for Styrikovich).
2. Energeticheskiy institut Akademii nauk SSSR.
(Feed water)

615

Hydraulics of Gas-and-Liquid Systems

also thank the reviewer, V. G. Levich, and the editor, L. A. Vitman. There are 81 references, 73 of which are Soviet, 2 German, 2 French, 4 English.

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Card 2/8

STYRIKOVICH, M.A., prof., doktor tekhn.nauk; KATKOVSKAYA, K.Ya., kand. tekhn.
nauk, dotsent; SEROV, Ye.P., kand.tekhn.nauk, dotsent; NIKOLAYEV,
V.V., red.; LARIONOV, G.Ye., tekhn.red.

[Boiler units] Kotel'nye agregaty. Moskva, Gos. energ. izd-vo.
1958. 487 p. (MIRA 12:2)

1. Chlen-korrespondent AN SSSR; zaveduyushchiy Kafedroy kotel'nykh
ustanovok Moskovskogo ordena Lenina energeticheskogo instituta (for
Styrikovich).
(Boilers)

STYRIKOVICH, M.A.; LIPOV, Yu.M.; MARTYNOVA, O.I.; REZNIKOV, M.I.

Developing optimum phosphate conditions for superhigh-pressure
boilers. Nauch. dokl. vys. shkoly; energ. no.2:185-198 '58.
(Boilers) (MIRA 11:11)

100/30-54-2-18/51
AUTHOR: Styrikovich, K. A., Corresponding Member, Academy of Sciences,
USSR

TITLE: From the Experience of Czechoslovakian Power Engineers
(Iz opyta **chekhoslovatskikh** energetikov)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 9, pp. 83-84 (USSR)

ABSTRACT: Power supply is secured by a uniform high-voltage grid covering the whole territory of the republic. The power supply comes primarily from thermal power stations (steam turbines) which use mineral and brown coal for firing. The share of hydroelectric power stations is about 13-14 %. The power output of the individual aggregates is too low. However, the construction of steam turbines of 50 000 kW and of generator boilers with a steam output of 100-125 t/per hour is continued instead of such with 200 000 kW and 600-650 t/per hour. This would considerably reduce the prime costs per kW and the fuel consumption. But such a transition is insufficiently prepared as yet. In the Institut issledovaniya mashin Chekhoslovatskoy Akademii nauk (Institute of Machine Testing of the Czechoslovakian AS) together with the labora-

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SOV/96-58-11-7/21

AUTHOR: Styrikovich, M.A., Corresponding Member of the
Academy of Sciences USSR
Matveyev, G.A., Doctor of Technical Science
Popyrin, L.S., Engineer

TITLE: The Selection of End Pressure (Vacuum) for Large
Regional Electric Power Stations (Vybor konechnogo
davleniya dlya GRES bol'shoy moshchnosti)

PERIODICAL: Teploenergetika 1958, Nr 11, pp 42-46 (USSR)

ABSTRACT: In designing large power stations it is not usual
to make individual prescriptions for the technical
and economic features of the condensing equipment
and water-supply systems. On the contrary, to
secure the greatest possible standardisation, the
turbine manufacturers make a single type of
condenser for a given type of turbine. As will be
seen from Table 1, all Soviet turbines now produced
or projected are intended for a vacuum of
0.03 - 0.035 atm and have condensers with a
specific steam loading in the range 35 - 46 kg/m²·hr.
The power station water-supply is designed in
accordance with the manufacturers data on the

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The Selection of End Pressure (Vacuum) for Large Regional
Electric Power Stations

condensers. This leads to irrational results; in a number of large power stations with turbines of 200 MW located in various climatic regions and burning fuels of different costs, identical condensers are used as observed in Table 2. The turbine manufacturers should now provide a range of condenser sizes for each type of turbine. Fuel costs are particularly important in this matter since they may range from 140 roubles per ton in the European part of the country to 10 roubles per ton in Siberia. Local climatic conditions and, therefore, cooling-water temperature, vary widely. Cooling-water conditions are at present simply taken from an All-Union standard. Determination of the vacuum from the annual mean cooling-water temperature gives rise to considerable error and it would be better to use monthly mean figures. The conditions that should be assumed for technical and economic calculations on condensers are then discussed. In

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The Selection of End Pressure (Vacuum) for Large Regional
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determining the power consumption of circulating pumps, allowance is made for a considerable reduction in output during the winter season. Fig.2. graphs the relationship between power expenditure on circulation-pump drive and power loss in the turbine resulting from impaired vacuum for three different climatic regions of the country. The method of making economic comparisons between different types of condensing conditions is explained. Replacement and repair costs for two variants are compared in table 3. A graph showing various condenser characteristics as a function of fuel cost and cooling-water temperature is given in Fig.3. The increased useful output of electricity as a function of the cooling-water temperature and fuel costs is seen in Fig.4. The results of calculations of the best water-velocity in the condenser are plotted in Fig.5. The following conclusions are drawn from the calculations. The optimum vacuum in the condenser of a turbine type PVK-200 depends considerably on the cooling-water

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The Selection of End Pressure (Vacuum) for Large Regional
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temperature and the price of fuel; it ranges from 0.025 atm for a cooling-water temperature of 6°C and expensive fuel to 0.45 atm for 15°C and cheap fuel. The standard condenser supplied by the Leningrad Metal Works for turbine type PVK-200 does not permit the greatest economy to be obtained particularly in southern regions or where fuel is expensive. A further two or three types of condenser should be designed for this turbine and characteristics are recommended. Various other recommendations of the same kind are made about condenser design. There are 5 figures, 3 tables and 2 literature references both of which are Soviet.

ASSOCIATION: Energeticheskii institut AN SSSR (Power Institute,
Academy of Sciences, USSR)

Card 4/4

STYRIKOVICH, M.A.; FAKTOROVICH, L.Ye.

Effect of the tube length on the value of critical heat flow in
the case of forced motion of steam-water mixture. Dokl. AN SSSR
120 no. 5:1018-1020 Je '58. (MIRA 11:8)

1. Chlen-korrespondent AN SSSR (for Styrikovich).
(Heat engineering)

STYRIKOVICH, M.A., prof., red.; OSOKINA, V.I., red.; REZOUKHOVA, A.G.,
tekh.n.red.

[Nuclear power; collection of reports of the Second Geneva
Conference on some questions of nuclear power] IAdernaia energe-
tika; sbornik dokladov 2-i Zhenevskoi konferentsii po nekotorym
voprosam iadernoi energetiki. Pod red. M.A.Styrikovicha. Moskva,
Izd-vo inostr.lit-ry, 1959. 179 p. (MIRA 12:9)

1. International Conference on the Peaceful Uses of Atomic Energy.
2d, Geneva, 1958. 2. Chlen-korrespondent AN SSSR (for Styrikovich).
(Nuclear engineering)

24(6)	PHASE I BOOK 2. PUBLICATION	SCV/1399
<p>Academiya nauk SSSR. Otdeleniye khimicheskikh nauk</p> <p>Termodinamika i struktura rastvorov: trudy sovetskikh nauchnykh seminarov po termodinamike i strukture rastvorov. Moscow, 1979. 459 p. 3,000 copies printed.</p> <p>Ed. M. I. Shubakov, Doctor of Chemical Sciences; Ed. of Publishing House: N. G. Yegorov; Tech. Ed.: T. V. Poljakova.</p> <p>Notes: This book is intended for physicists, chemists, and chemical engineers.</p>		
<p>CONTENTS: This collection of papers was originally presented at the Conference on Thermodynamics and Structure of Solutions, sponsored by the Section of Chemical Sciences of the Academy of Sciences, USSR, and the Department of Chemistry of Moscow State University, held in Moscow on January 27-30, 1978. A list of other reports and books listed in the Foreword. A list of other reports and books listed in the Foreword. A list of other reports and books listed in the Foreword. A list of other reports and books listed in the Foreword.</p>		
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Styrikovich, M. A.

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STYRIKOVICH, M.A., red.; SEREGINA, N.V., red.; KHAR'KOVSKAYA, L.M.,
tekhn.red.

[Some problems in nuclear power engineering] Nekotorye voprosy
iadernoi energetiki; sbornik statei. Moskva, Izd-vo inostr.
lit-ry, 1959. 347 p. (MIRA 13:10)

1. Chlen-korrespondent AN SSSR (for Styrikovich).
(Nuclear engineering)

PLANS I BOOK REVIEWS 800/3407

Abstracts and 8000. Biologically active in. O.M. Enthalpy and
 Problem energy; generally postgraduate students O.M. Enthalpy and
 (Problem of Power Engineering) Collection of articles dedicated to ac-
 celeration O.M. Enthalpy and 1979. 691 p. Kireva 114 inserted.
 2,500 copies printed.

See. of Publishing House: B.N. Akhmedov, P.V. Dobry, P.I. Dobry, and
 A.M. Kozlovskiy. N.S. Akhmedov, A.M. Kozlovskiy, P.I. Dobry, and
 A.M. Kozlovskiy (Moscow). V.I. Kozlov (Moscow). Corresponding member,
 Academy of Sciences USSR. V.I. Kozlov, A.M. Kozlovskiy, P.I. Dobry, and
 A.M. Kozlovskiy. Candidate of Technical Sciences, P.I. Dobry, and
 A.M. Kozlovskiy. Candidate of Technical Sciences, P.I. Dobry, and
 A.M. Kozlovskiy.

REVIEW: This collection of articles is intended as a reference to the energy
 of Academician O.M. Enthalpy and.

CONTENTS: The collection contains sixty articles by twenty students and
 members of the Moscow Institute of Engineering. The articles deal with problems
 of a wide range of subjects in the field of power engineering: problems
 of the regional development of electrical and thermal power engineering,
 power engineering technology and the physics of combustion. No particular
 are mentioned. References are given after each article.

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Abstracts in Power Engineering: 375

Abstracts, 2.1. A.M. Kozlovskiy, N. V. Dobry, and A.M. Kozlovskiy. 375

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Abstracts, 2.1. A.M. Kozlovskiy, N. V. Dobry, and A.M. Kozlovskiy. 375

SOV/30-59-2-2/60

8(5), 8(4)

AUTHOR:

Styrikovich, M. A., Corresponding Member, Academy of Sciences,
USSR

TITLE:

The Importance of Thermal Power Plants in the Development of
Power Engineering in the USSR (Rol' teplovykh elektrostantsiy v
razvitiy energetiki SSSR)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1959, Nr 2, pp 11-16 (USSR)

ABSTRACT:

The author of the present paper investigates the problem of expediency of the construction of thermal power plants. In this connection he is of the opinion that only those water-power plants with low specific construction costs and a short time of amortization (8-10 years) are to be given preference. The immense increase in the yield of natural gas and cheap mineral oil in the Ural-Volga district permits to cease to exploit a number of expensive solid fuels. By a different construction of the thermal power plants the economic production figures are highly improved. At present, the biggest units in operation in the USSR are steam turbines of 150 Mw. At a steam pressure of 90 atmospheres absolute pressure and a steam temperature of 550° without secondary superheating they cause high specific con-

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SOV/96-59-2-14/18

The Influence of the Length of a Heated Section of Tube on the Magnitude of Critical Rates of Heat Transfer During Forced Motion of a Steam-Water Mixture

seamless tube of stainless steel grade EYa-IT, of diameter 3.04 x 0.5 mm and of length 331, 160 or 40 mm. The tubes were heated by alternating current. Superheated steam at 300 atm and 500 to 600°C from a once-through boiler was delivered to the tubes. After steam supply conditions had become steady electric current was supplied to the tube and the heat flux was raised in small steps. Conditions were adjusted after each increase and this was continued until critical boiling occurred which was recognised by a sudden sharp increase in the tube wall temperature. The errors that might arise in the work are estimated. Curves of critical rates of heat transfer as function of steam content and l/d ratio are given in Fig 1, 2 and 3. It will be seen that on all graphs over the investigated range of pressure, speed and steam content, as the tube length is increased from 40 to 331 mm the critical heat transfer rate is reduced by a factor of 1.5 to 5. It is explained

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The Influence of the Length of a Heated Section of Tube on the Magnitude of Critical Rates of Heat Transfer During Forced Motion of a Steam-Water Mixture

that experimental points that are underlined on the graph are lower than they should be. The influence on critical rates of heat transfer of pressure, speed and steam content, which have been described elsewhere are confirmed. Curves of critical rates of heat transfer as function of L/d are given in Fig 4, from which it will be seen that the influence of this ratio is particularly great when the ratio is small. When the ratio is greater than 50 it has much less influence on the critical rate of heat transfer. Suggestions are made as to the reasons why the critical rate of heat transfer should depend on tube length when a two-phase medium is heated. It is concluded that in the case of forced motion of steam water mixture in a vertical steam raising tube 3 mm diameter at pressures of 26, 100 and 180 atm and flow rates of 850 and 3000 kg/m²sec and steam contents of 0 to 0.8 as the length of the experimental tube is diminished from 331 to 40 mm the values of critical rate of heat transfer increased by a factor of 1.5 to 5 with

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The Influence of the Length of a Heated Section of Tube on the Magnitude of Critical Rates of Heat Transfer During Forced Motion of a Steam-Water Mixture

the tube diameter used. For a tube of given diameter the influence of length on critical values of heat flow becomes less as the flow rate, pressure and steam content increase. Since the usual experimental installations have tubes that are very much shorter than are found in practice the influence of the length should be taken into account in design practice. There are 4 figures and 9 references of which 7 are Soviet and 2 English.

ASSOCIATION: Energeticheskiy Institut AN SSSR (Power Institute, AS USSR)

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SOV/96-59-4-6/21

AUTHORS: ~~Styrikovich~~, M.A., Corresponding Member of the Academy of Sciences of the USSR,
Matveyev, G.A., Doctor of Technical Sciences and
Popyrin, L.S., Engineer

TITLE: Selection of the Best Unit Outputs for Single and Two-shaft Turbines (Vybor optimal'nykh yedinichnykh moshchnostey odnoval'nykh i dvukhval'nykh turbin)

PERIODICAL: Teploenergetika, 1959, Nr 4, pp 31-38 (USSR)

ABSTRACT: The advantages of using very large turbines are first discussed. The problem then arises of when to make them with one and when with two shafts. The common Soviet practice of making single shaft turbines of up to 400 MW with a minimum number of exhausts does not adequately take account of actual operating conditions in the majority of regions of the Soviet Union. The maximum output that can be obtained from a single exhaust condensing turbine with given initial steam conditions and regenerated cycle is governed by the flow of steam through the section of the last stage of the turbine. In the next few years the turbine manufacturers will use last blades 940 mm long at 3,000 rpm which give an outlet

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Selection of the Best Unit Outputs for Single and Two-shaft Turbines

area of 7.3 sq m. Further increase in the total exhaust section and consequently in the turbine output can be obtained by subdividing the steam flow in the last stages of the turbine. There are two practical ways of doing this: either by increasing the number of exhausts to three or four for a single shaft turbine or by using two shaft turbines. The advantages of these approaches are considered in relation to normal cooling water temperatures. The influence of fuel cost on the best size of turbine is also considered. Technical and economic calculations were made for a turbine type PVE-400 in the five variants illustrated in Fig.1 in order to determine the best final steam conditions and the best value of loading of the exhaust section of the last stage. The first variant uses a single shaft, the second and third use two shafts each running at 3,000 rpm with 6 and 8 exhausts respectively. The fourth and fifth variants are two shaft sets running at different speeds. Curves showing the variation in output of these variants

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as the pressure in the condenser is altered are given in Fig.2. The factors that were taken into account in the calculation are described, they include the cost of the turbine, the cost of the generator and the cost of the foundations. These cost data are collected together in table 1. The construction and operating costs are compared using eq.4 with a pay-off time of ten years. Efficiency and output curves for the different variants are given in Fig.4. When the final steam conditions that have been adopted for currently produced and proposed future sets, which are given in table 2, are compared with the optimum values, see Fig.3, it will be found that the turbines of the Leningrad and Khar'kov Works cover a very narrow range of variation of the magnitudes that govern the final steam conditions and this reduces the efficiency of power stations using these turbines because insufficient attention is paid to actual operating conditions. Curves relating the best limiting output of a single shaft turbine with the price of fuel and the cooling water temperature are given in Fig.5. It is seen that in a number of regions of the Soviet Union the

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limiting output of a single shaft turbine ranges as follows: 200 - 250 MW for the South-West and Central European part and 350 - 400 MW for Siberia and the South. The best limiting output for two shaft turbines with various total exhaust areas, fuel prices and cooling water temperatures are given in Fig.6. It will be seen from this figure that in different regions of the Soviet Union the best maximum output of a two-shaft turbine varies over a wide range or, to put it another way, for a turbine of a given output the total exhaust area of the last stages should vary over a wide range to suit different conditions. There are 6 figures, 2 tables and 1 Soviet reference.

ASSOCIATION: Energeticheskii Institut AN SSSR (Power Institute
Ac.Sc. USSR)

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SOV/96-59-8-10/27

AUTHORS: Styrikovich M.A. Corresponding Member Academy of Sciences
USSR. Serov, Ye.P. Candidate of Technical Sciences,
Smirnov, O.K., Engineer

TITLE: The Influence of Displacing the Transition Zone in Once-
Through Boilers for Super-Critical Pressure

PERIODICAL: Teploenergetika 1959, Nr 8. pp 33-37 (USSR)

ABSTRACT: Displacement of the transition zone into the convective part of the furnace in order to increase the period between boiler washing was first tried on the fourth once-through boiler type 24-SP-200/140 to be installed. In the three preceding types of boiler the transition zone was not displaced. It has been observed that displacement is accompanied by more intense scaling at the end of the evaporation zone and in the first stages of super-heat. It should be noted that the experimental data that served as a basis for displacement of the transition zone were obtained on an experimental once-through boiler fed with water having a relatively high concentration of non-volatile contaminants. Then the results of displacing the zone were mainly checked

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The Influence of Displacing the Transition Zone in Once-Through Boilers for Super-Critical Pressure.

on industrial medium-pressure boilers fed with water of a quality that would now be considered poor. Displacement can only be effective if scaling is concentrated in a particular part of the boiler; and if the scaling is distributed over a considerable range of increase in enthalpy of the steam, a transition zone entirely in the convective part of the furnace is scarcely feasible. This is particularly the case in unit-type sets whose feed-water temperature is reduced at partial load so that the boundary between evaporation and super-heating surfaces is displaced. The presence of various impurities in the feed water, and their solubility under different conditions, are then considered. A typical curve of the solubility of calcium sulphate in superheated steam as a function of temperature at constant pressure is given in Fig 1. Most substances behave in this way under super-critical conditions, that is, there is a temperature region of minimum solubility. In calculating the density of scaling by a substance from solution, it suffices to know the functional

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relationship between the solubility of the substance in steam and the temperature, though unfortunately adequate information about this subject is not always available. The different substances that occur in feed water are then considered in turn, including various sodium, calcium and magnesium compounds and silica. The zones of maximum deposition of calcium and sodium sulphates in a once-through boiler at pressures of 240 and 300 atms have been calculated from data about the solubility of these substances as a function of super-heated steam temperature: the results are given in Table 2. It will be seen that the temperature range of scaling is only 38°C, but that it corresponds to the considerable increase in steam enthalpy of 195 kcal/kg. The temperature range of maximum deposition of sodium and calcium sulphates is 63°C with an enthalpy increase of 231 kcal/kg. The region of extensive deposition is broadened if the quality of feed water is impaired, as will be seen from the results plotted in Figs 2 and 3. The influence of mass exchange on the rate of deposition of

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The Influence of Displacing the Transition Zone in Once-through Boilers for Super-Critical Pressure

calcium sulphate at 300 atms is plotted in Fig 4, showing that the effect is to extend the region of scaling. It is concluded that with the usual designs displacement of the transition zone cannot be fully effective; as a good deal of the scaling occurs outside this zone. The position is still further complicated by interaction between different salts. Experiments at the Moscow Division of the Central Boiler Turbine Institute indicate that scale should not be allowed to become thicker than 0.1 to 0.2 mm, otherwise it will be difficult to wash off. This may correspond to a temperature rise of up to 60°C, which is not serious except in the most intensely heated parts of the tube. Therefore, it should be possible to arrange for reliable operation of the boiler without displacement of the transition zone although, of course, the region of maximum scaling should be kept away from the hottest part of the flame, and this is usually not difficult to accomplish. Thus there is no need to displace the transition zone in boilers near or above the critical pressure. It would be desirable to

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The Influence of Displacing the Transition Zone in Once-Through Boilers for Super-Critical Pressure

make a further study of scale formation when the feed water contains a number of different impurities. There are 4 figures, 2 tables and 3 Soviet references.

ASSOCIATION: *Moekobeli energeticheskii*, Institut (The Moscow Power Institute)

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SOV/96-59-9-9/22

AUTHORS: Styrikovich, M.A., (Corresponding Member, Ac.Sc. USSR),
Martynova, O.I., Khaybullin, I.Kh. (Candidates of
Technical Sciences) and Mingulina, E. I. (Engineer)

TITLE: Some Relationships of the Transfer of Weak Mineral Acids
to Saturated Steam

PERIODICAL: Teploenergetika, 1959, Nr 9, pp 50-56 (USSR)

ABSTRACT: In studying the carry-over of substances from boiler water
by steam it has been noticed that the elements Si, B and
Al, whose compounds are of high solubility in steam, have
hydroxides which are weak electrolytes and so should be
present in the boiler water primarily in molecular form.
There was thus reason to suppose that the ability of a
compound to become dissolved in steam depends upon whether
it is in molecular or ionic form in the boiler water.
Indeed, as will be seen from the graphs given in Fig 1,
strong electrolytes are much less soluble in saturated
steam than in weak, and they are much less subject to
transfer to the steam. In relatively weak alkaline
solutions the salts of weak acids are hydrolysed,
particularly at high temperatures and low alkalinities.
Under such circumstances, molecules of the corresponding

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Some Relationships of the Transfer of Weak Mineral Acids to Saturated Steam

acids can be present in the boiler water and can be transferred relatively easily to the saturated steam. The transfer to saturated steam of salts that are not hydrolysed is probably due to the formation in solution of ionic pairs; however, ions can only participate in the contamination of steam at extreme values of pH. Materials soluble in ionic form become important near the critical pressure and even then only at low values of pH. It may be assumed that under ordinary conditions all the transfer to steam is by transfer of molecules contained in the water. The solubility of silica compounds in steam has been studied in particular detail. The various forms of silica and silicic acid that are present in equilibrium are shown in Eq (1). This system may be quantitatively characterised by the hydrolysis equation (2) or (3). It follows from the equations that the equilibrium state corresponding to a given temperature and silica content of the boiler water is functionally related to the concentration of OH^- or OH ions in solution. Thus alteration in the pH value alters the equilibrium, so that at any given temperature the concentration of the most

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soluble form of silica in steam is a single-valued function of the pH value of the boiler water. A distinction is drawn between the real and apparent distribution coefficients of silica in steam. The ratio of H_2SiO_3 in the steam to the total silica content of the boiler water expressed as SiO_2 is the apparent distribution coefficient. It is sometimes called the transfer coefficient, and is given by Eq (4). However, the true distribution coefficient is the ratio of H_2SiO_3 in the steam to that in the water, which is a function only of the densities of the two media. The true and apparent transfer coefficients are related by Eq (6). Using Eq (6) it is easy to calculate the concentration of the molecular form of silicic acid that can be present in solution for any given total silica content at a given pH value. The degree of hydrolysis should be calculated at the correct temperature. Graphs showing the proportions of different forms of silicic acid in solution as functions of the pH value are given in Fig 2. The graph is based on the pH value of cold water: the

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relative proportions of the different silica compounds would be very different at a temperature of 316 °C at a pressure of 110 atm, because the pH value is very different under these conditions. Similar curves may be constructed for other substances, and by way of example curves of the apparent distribution coefficient of boric acid as function of pH value are given in Fig 3. Curves of the degree of hydrolysis as functions of the true pH value for compounds with different dissociation constants are given in Fig 4. Here it will be seen that reduction in the dissociation factor leads to an increase of the proportion in molecular form for any given value of pH. An attempt was made to estimate approximately the value of the dissociation factor for silicic acid at high water temperature; the results are plotted in Fig 5. Published experimental points are included and show good agreement with theoretical curves. The curves of the dissociation constant of silicic acid as functions of water temperature are given in Fig 6. All the calculated points lie on the saturation line and so reflect the

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Some Relationships of the Transfer of Weak Mineral Acids to
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dependence of the dissociation constant on pressure as well as on temperature. In conclusion, the article by Kostrikin published in Teploenergetika Nr 6, 1958, is adversely criticised and it is claimed that Kostrikin reaches incorrect conclusions, particularly in supposing that the dissociation factor of silicic acid is independent of temperature.

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There are 6 figures and 5 references, of which 3 are Soviet, 1 German and 1 English.

ASSOCIATION: Energeticheskii institut AN SSSR and Moskovskiy energeticheskii institut (Power Institute, Ac. Sc. USSR, and Moscow Power Institute)

STYRIKOVICH, M.A.; MATVEYEV, G.A., doktor tekhn. nauk; POBYRIN, L.S.,
inzh.

Selecting the end pressure and passage cross sections for the last
stages of high-capacity steam turbines. Elek. sta. 30 no.3:34-40
Mr '59. (MIRA 12:5)

1.Chlen-korrespondent AN SSSR (for Styrikovich).
(Steam turbines)

24(8)

SOV/20-127-2-23/70

AUTHORS:

Styrikovich, M. A., Corresponding Member, AS USSR, Mostinskiy, I. L.

TITLE:

On the Influence of Uneven Heating of the Pipe Perimeter
on the Quantity of Critical Heat Flows

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 316-319 (USSR)

ABSTRACT:

Pipe perimeters having uneven and (for comparison) even heat distributions were used for the present experiments. The uneven heat distribution was effected by electric heating of eccentrically bored pipes. In table 1 the dimensions of the pipes investigated are listed. The heat flow at the different points of the pipe circumference was determined by the variation of the electric resistance. The experimental equipment and methods have been described in another paper (Ref 1). Three different values for the specific heat flow were determined: q_b at the locus of greatest thickness, q_m at the locus of least thickness, and q_{gr} , the mean heat flow. Results of measurement are summarized in a diagram (Fig 1). Herefrom it follows that uneven heating reduces the critical heat flow. Values obtained for the critical heat flow in evenly and unevenly heated pipes are given in a diagram (Fig 2). From the two diagrams it may be seen that the influence of uneven heating

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decreases with increasing pipe diameter. After a general discussion of the results an empirical formula is suggested for estimating the influence of uneven heating of the pipes on the critical heat flow. A. A. Stavrovskiy, L. Ye. Faktorovich, I. S. Shagov, M. A. Kalashnikova, M. M. Yegorov, M. I. Petukhov and M. I. Kazennova assisted in the experiments. There are 4 figures, 1 table, and 3 Soviet references.

ASSOCIATION: Energeticheskiy institut im. G. M. Krzhizhanovskogo Akademii nauk SSSR
(Institute of Power Engineering imeni G. M. Krzhizhanovskiy of the Academy of Sciences, USSR)

SUBMITTED: April 28, 1959

Card 2/2

VEITS, V.I.; MELENT'YEV, L.A.; and STYRIKOVICH, M.A.

[Methods of Investigation of Energy Requirements]
"Principles of Compiling Energy Balance in the USSR."

report to be presented at the Sectional Meeting of the World Power Conference
Madrid, Spain, 5-9- June 1960.

STYRIKOVICH, M.A. (Moskva)

Basic problems of heating and power engineering balance in the
U.S.S.R. Izv. AN SSSR Otd. tekhn. nauk. Energ. i avtomat. no.1:
3-11 Ja-F '60. (MIRA 13:2)
(Power engineering)

STYRIKOVICH, M.A.; MIROPOL'SKIY, Z.L., kand.tekhn.nauk; SHITSMAN, M.Ye.,
kand.tekhn.nauk; MOSTINSKIY, I.L., inzh.; STAVROVSKIY, A.A., inzh.;
FAKTOROVICH, L.Ye., inzh.

Effect of superimposed elements on the setting up of boiling
crisis in the steam generating pipes. Teploenergetika 7
no.5:81-88 My '60. (MIRA 1):8)

1. Energeticheskiy institut AN SSSR. 2. Chlen-korrespondent AN
SSSR (for Styrikovich).
(Heat--Radiation and absorption) (Boilers)

STYRIKOVICH, M.A.; MATVEYEV, G.A., doktor tekhn.nauk; BELYAYEV,
V.I., inzh.

Selecting the optimal temperature for flue gases of
power boilers. Teploenergetika 7 no.7:27-32 J1 '60.
(MIRA 13:7)

1. Energeticheskiy institut AN SSSR. 2. Chlen-korres-
pondent AN SSSR (for Styrikovich).
(Boilers)

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S/096/60/000/009/003/008/XX
E194/E484

26.2230

AUTHORS:

Styrikovich, M.A., Corresponding Member AS USSR,
Bartolomey, G.G., Vinokur, Ya.G. and Kolokol'tsev, V.A.,
Candidates of Technical Sciences

TITLE:

✓ The Influence of the Concentration of a Suspension of
Uranium Oxide on the Steam Content by Volume Under
Bubbling Conditions

PERIODICAL: Teploenergetika, 1960, ¹No.9, pp.19-22

TEXT: When steam is bubbled through a suspension the process is
influenced not only by the properties of the liquid and steam phases
but also by the concentration of the suspension, the density of the
solid phase and the fineness of its particles. The experiments
were commenced with tests at atmospheric pressure using the
uranium oxides U_3O_8 and UO_3 as the dispersed phase in condensate.
Data is given on the particle size composition of the oxides used,
which were mostly greater than 10 microns. The steam content by
volume of the oxide suspension was determined by irradiation with
gamma rays. The formula that was used in the determinations is
given and experimental justification for its use is provided.
It was shown that the irradiation absorption factor did not depend
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The Influence of the Concentration of a Suspension of Uranium Oxide on the Steam Content by Volume Under Bubbling Conditions

on the thickness of the irradiated layer or on the fineness of the suspension, at any rate within the range of values tested. A graph of the relationship between the absorption factor and the concentration of suspensions of the two uranium oxides is given in Fig.1. Tests were then made to determine the influence of the structure of the suspension on the mean steam content by volume. The suspension could be irradiated in the vertical and horizontal directions and from curves of the distribution of local values of steam content mean values of steam content were calculated. The tests clearly showed that the gamma irradiation method could be used to determine the steam content by volume of a suspension. Tests carried out with the system water-air and with suspension-air showed that with concentrations of U_3O_8 up to 10% in the water its presence has no influence on the air content of the suspension by volume as compared with pure water. As will be seen from the graph in Fig.2, increase in the concentration of the suspension above 30% causes some diminution in the air content. After these preliminary tests the main series of tests were made on the system
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S/096/60/000/009/003/008/XX
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The Influence of the Concentration of a Suspension of Uranium Oxide on the Steam Content by Volume Under Bubbling Conditions

suspension-steam. The tests were made on an atmospheric pressure column made of stainless steel with sight glass, illustrated diagrammatically in Fig.3. Irradiation was effected with a source of Co^{60} with an activity of about 10 millicuries. Brief details of the experimental procedure are given. From the tests local and mean values of the volumetric steam content were obtained for various rates of passage of steam with columns of different heights and suspensions of different concentrations of the two oxides of uranium, the results are plotted in Fig.4. The distribution of steam content by height is similar to that for condensate, i.e. there is an initial section on which the steam bubbles are stabilized a section of steady motion where the steam content by volume remains practically constant and an upper section of fairly rapid increase in steam content with height. Increase in the uranium oxide content up to 12 to 14% reduces the steam content slightly on the stabilized section, i.e. the steam bubbles rise somewhat more rapidly than in pure water. Increasing the concentration of uranium trioxide from 4 to 20% causes very slight increase in the volumetric steam content on the stabilized section.

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The Influence of the Concentration of a Suspension of Uranium
Oxide on the Steam Content by Volume Under Bubbling Conditions

The volumetric steam content on the stabilized section is practically independent of changes in the level in the range of 200 to 600 mm and depends mainly on the referred steam velocity, as will be seen from the graphs plotted in Fig.5 which are discussed in some detail. The difference between the volumetric steam contents of suspension and condensate decrease with increase in the referred velocity of the steam, i.e. with increased rate of steaming. For referred speeds in the range 0.7 to 0.9 m/sec the difference in the value of the steam content for condensate and suspension does not exceed 3 to 5%. There are 5 figures.

ASSOCIATION: Energeticheskiy institut AN SSSR
(Power Engineering Institute AS USSR)

Card 4/4

VEYTS, V.I.; MELENT'YEV, L.A.; STYRIKOVICH, M.A.

Basis for establishing a fuel and electric power balance in the
U.S.S.R. Elek.sta. 31 no.7:34-41 J1 '60. (MIRA 13:8)

1. Chleny-korrespondenty AN SSSR (for all)
(Electric power) (Fuel)

MARGULOVA, T.Kh., doktor tekhn.nauk, prof.; STYRIKOVICH, M.A., doktor tekhn.nauk, prof.

Heat and power engineering as carried out in the plan of the State Commission for the Electrification of Russia down to the present day. Trudy MEI no.33:41-78 '60. (MIRA 15:3)

1. Chlen-korrespondent AN SSSR (for Styrikovich).
(Electric power production)

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S/020/60/130/05/018/061

B013/B014

AUTHORS: Styrikovich, M. A., Correspond-
ing Member of the AS USSR, Nevstruyeva, Ye. I.

TITLE: Investigation of the Distribution of Vapor Contents in a
Boiling Boundary Layer by the Method of Beta-radioscopy 17

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 5, pp 1019-1022
(USSR)

ABSTRACT: The investigations discussed in the present paper were carried out by the Laboratoriya vnutrikotlovnykh protsessov Energeticheskogo instituta Akademii nauk SSSR (Laboratory for Processes Taking Place in Boilers of the Power Engineering Institute of the Academy of Sciences of the USSR). The penetration of the medium under investigation by a narrow beam of rays proved to be most convenient for this purpose. Thus, it is possible to measure not only the vapor content averaged over the channel cross section but also the local value or value of the vapor content averaged over a small thickness region of the boiling layer. The heating surface was shifted with respect to the beam. As usual, the experimental device forms a closed circle. A formula is given for the determination of the vapor content. Besides the principal and auxiliary measurements for

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Investigation of the Distribution of Vapor
Contents in a Boiling Boundary Layer by the
Method of Beta-radioscopy

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B013/B014

the determination of the vapor content, the following measurements were made by the authors: 1) The thermal stress of the heating surface was determined from the amperage and the voltage drop on the plate. 2) The water temperatures at the input and output of the region investigated were recorded by thermocouples. 3) The flow velocity of water in this region was determined from the water consumption. 4) The pressure in front of and behind this region was determined by means of check pressure gauges. In each experimental series, the authors measured the temperature dependence of the vapor content with constant thermal stress, constant pressure, and constant velocity. At high temperatures, the vapor content depends but little on temperature. This temperature dependence is, however, steeper when a bubbly liquid is penetrated by rays. Figure 2 shows entropy diagrams of the vapor contents for various temperatures, velocities, and thermal stresses. The effect of velocities is noticeable even with slight velocity differences. With great velocity differences, the effect of the degree of inter-

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Investigation of the Distribution of Vapor
Contents in a Boiling Boundary Layer by the
Method of Beta-radioscopy

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mixture of the liquid becomes noticeable also in the immediate neighborhood of the heating surface. The higher the temperature of the liquid, the higher thermal stress, and the lower velocity, the greater are the height of the boiling layer and the reduced thickness of the vapor film. With relatively small thermal stresses and correspondingly high temperatures of the current, the thickness of the boiling layer is relatively small, and the maximum local values of the vapor contents can increase up to 0.98. The higher the critical thermal stress, the larger is the thickness of the boiling layer. On the strength of the experimental results under discussion it is possible to explain the mechanism of critical boiling in a new way. Besides, these data are not indicative of any relation between the development of a crisis and the attainment of a certain constant value of the vapor content of the boiling layer. There are 3 figures.

ASSOCIATION: Energeticheskiy Institut im. G. M. Krzhizhanovskogo Akademii
nauk SSSR (Power Engineering Institute imeni G. M. Krzhizhanov-
Card 3/4 skiy of the Academy of Sciences of the USSR) ✓

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Investigation of the Distribution of Vapor
Contents in a Boiling Boundary Layer by the
Method of Beta-radioscopy

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B013/B014

SUBMITTED: October 6, 1959

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Card 4/4

Investigation of the Solubility of Boric Acid
in Saturated Water Vapor

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B016/B054

centration in the range mentioned. As compared with other inorganic compounds, boric acid is very well soluble in water vapor, even at low pressure. Fig. 2 shows the values of the visible distribution coefficients of boric acid as dependent on the relation of the densities of the solvent phases (Ref. 2). This dependence is represented by an exponential function (see Equation). Fig. 2 shows that the values of the distribution coefficient agree well with the individual points determined at the Moskovskiy energeticheskii institut (Moscow Power Engineering Institute). Boric acid is characterized by the maximum value of the visible distribution coefficient and, accordingly, by the lowest exponent n . This is due to the fact that boric acid, being a weak acid, is practically in a nondissociated state in water. This confirms the theorem stating that compounds which are in an aqueous solution in the form of molecules migrate preferably into the vapor (Ref. 3). The experimental results are also indicative of this fact (Fig. 3). The experiments were made with binary solutions, one component of which was boric acid. The visible distribution coefficient of boric acid is practically not influenced even by the addition of larger amounts of NaCl or Na_2SO_4 , if the pressure remains unchanged. From their

Card 2/3

STYRIKOVICH, Mikhail Adol'fovich; REZNIKOV, Matvey Isaakovich. Prinimal
uchastiye MIROPOL'SKIY, Z.I., kand. tekhn. nauk; BORUNOV, N.I.,
tekhn. red.

[Methods for the experimental study of processes taking place inside
the boiler] Metody eksperimental'nogo izucheniia vnutrikotlovykh pro-
tssessov. Moskva, Gos. energ. izd-vo, 1961. 367 p. (MIRA 14:11)
(Boilers)

SHKROB, Mikhail Samoylovich, doktor tekhn. nauk; PROKHOROV, Fedor Georgiyevich, kand. tekhn. nauk. Prinsipialni uchastiye: AKOL'ZIN, P.A., doktor tekhn. nauk; APEL'TSIN, I.E., doktor tekhn. nauk; ZENKEVICH, Yu.V., kand. tekhn. nauk; KVIATKOVSKIY, V.M., kand. tekhn. nauk; KLYACHKO, V.A., doktor tekhn. nauk; GURVICH, S.M., inzh.; ORZHEROVSKIY, M.A., inzh.; STYRIKOVICH, M.A., retsenzent; MARTYNOVA, O.I., retsenzent; VORONIN, K.P., tekhn. red.

[Water treatment and water systems for steam-turbine electric power plants] Vodopodgotovka i vodnyi rezhim paroturbinnnykh elektrostantsii. Moskva, Gos. energ. izd-vo, 1961. 470 p. (MIRA 14:9)
(Feed water purification) (Steam turbines)

STYRIKOVICH, M.A.; SEROV, Ye.P., kand.tekhn.nauk

Problems in the development of the boiler industry. Teploener-
getika 8 no.7:3-8 J1 '61. (MIRA 14:9)

1. Moskovskiy energeticheskiy institut. 2. Chlen-korrespondent
AN SSSR (for Styrikovich).
(Boilers)

STYRIKOVICH, M.A.; BARTOLOMEY, G.G., kand.tekhn.nauk; VINOKUR, Ya.G.,
kand.tekhn.nauk; KOLOKOL'TSEV, V.V., kand.tekhn.nauk

Studying the entrainment of disubstituted phosphate and sodium
sulfate under conditions of atmospheric pressure. Teploenergetika
8 no.11:53-59 N '61. (MIRA 14:10)

1. Energeticheskiy institut AN SSSR. 2. Chlen-korrespondent
AN SSSR (for Styrikovich).
(Steam)

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B*04/B209

Effect of nonuniform heating ...

thermal flow ratio was 4.9. Occurrence of the boiling crisis was determined visually. The local value of specific thermal convection at the point of the arising crisis is regarded as the critical thermal convection. The q_{crit}^{nonu} values are listed in Fig. 1 in contrast to the q_{crit}^u values. Critical thermal convection in the case of nonuniform heating of the tubes (q_{crit}^{nonu}) is found to surmount the critical values in the case of uniform heating of the tubes (q_{crit}^u) by about twice their amount. A rather complex dependence was obtained only when pulsations (100 at, 400-850 kg/m².sec) developed. In this case, when incompressible water in the space at the entrance of the test tube is replaced by elastic water-vapor mixture, the q_{crit}^{nonu} values drop jumplike. The ratio between q_{crit}^{nonu} and q_{crit}^u is then nearly reciprocal to that given above. Experiments with decreasing thermal flow in the direction of the moving medium showed that q_{crit}^{nonu} was only half of q_{crit}^u when the cri-

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MELENT'YEV, L.A.; ~~STYRIKOVICH, M.A.~~; ~~SHTYNGAUZ, Ye.O.~~; ZAMYATINA,
I.M., red.; LARIONOV, G.Ye., tekhn. red.

[Fuel and power resources balance of the U.S.S.R.; basic
problems in economics and planning] Toplivno-energeticheski
balans SSSR; osnovnye voprosy ekonomiki i planirovaniia. Mo-
skva, Gosenergoizdat, 1962. 207 p. (MIRA 15:9)
(Power resources) (Fuel)

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E194/E435

2. 5400
AUTHORS: Alad'yev, I.T., Doroshchuk, V.Ye., Miropol'skiy, Z.L.,
Styrikovich, M.A.

TITLE: Critical boiling in tubes

SOURCE: Teploperedacha. Energ. inst. AN SSSR. Ed. by
M.A.Mikheyev. Moscow, Izd-vo AN SSSR, 1962. 124-132

TEXT: A good many critical boiling tests have been made in recent years, usually whilst water is being pumped through an electrically heated stainless steel pipe. It is usually considered that the critical heat transfer rate is uniquely determined by the pressure, rate of flow and the enthalpy of the medium at the place of critical boiling. This article considers the effects of other factors, such as the distribution of heat flow over the perimeter and length of the pipe, the dimensions of the test length and of neighbouring parts of the system and the compressibility of the fluid in neighbouring parts of the system. This latter point is important because flow pulsations can develop during the tests and when neighbouring spaces are filled with compressible substances, whereas if neighbouring spaces are
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Critical boiling in tubes

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be possible when the actual mechanism and physical laws of critical bubble-wise boiling are understood, which is not yet the case. There are 7 figures.

Card 3/3

STYRIKOVICH, M.A.; MARTYNOVA, O.I., kand.tekhn.nauk; SEROV, Ye.P., kand.-
tekhn.nauk

Analysis of the economic efficiency of some methods for removal
of impurities from the feed-water cycle of electric power plants
with once-through boilers. Elek. sta. 33 no.7:5-8 J1 '62.
(MIRA 15:8)

1. Chlen-korrespondent AN SSSR (for Styrikovich).
(Feed water) (Boilers)

STYRIKOVICH, M.A.; BARTOLOMEY, G.G., kand.tekhn.nauk; KOLOKOL'TSEV, V.A.,
kand.tekhn.nauk

Comparison of two possibilities for desalting feed water in the
cycle of an electric power plant operating on low-grade fuel.
Elek. sta. 33 no.7:8-11 J1 '62. (MIRA 15:8)

1. Chlen-korrespondent AN SSSR.
(Feed-water purification)